United Nations A/67/175

General Assembly

Distr.: General
31 July 2012

Original: English

Sixty-seventh session
Item 20 of the provisional agenda*
Sustainable development

Sustainable Energy for All: a Global Action Agenda

Note by the Secretary-General

The Secretary-General has the honour to transmit to the General Assembly the report of his High-level Group on Sustainable Energy for All, containing a Global Action Agenda.

* A/67/150.

12-43717 (E) 180912

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Sustainable Energy for All: a Global Action Agenda

Pathways for concerted action towards sustainable energy for all

Preface

In launching the "Sustainable Energy for All" initiative at the opening of the General Assembly in September 2011, my aim was to catalyse action around three clear objectives to be achieved by 2030:

(a) Ensuring universal access to modern energy services;

(b) Doubling the global rate of improvement in energy efficiency;

(c) Doubling the share of renewable energy in the global energy mix.

I asked Charles Holliday and Kandeh Yumkella to lead a High-level Group on Sustainable Energy for All and to deliver a Global Action Agenda prior to the holding of the United Nations Conference on Sustainable Development. This document reflects their work.

In January, I presented to the General Assembly my five-year action agenda, "The future we want" (General Assembly resolution 66/288), a plan to help create a safer, more secure, more sustainable and more equitable future. I made sustainable energy for all a top priority because it is central to all aspects of sustainable development. That same month, the High-level Panel on Global Sustainability, in its report entitled "Resilient people, resilient planet: a future worth choosing" (A/66/700), endorsed the "Sustainable Energy for All" initiative and said it should be implemented without delay.

That is why I am pleased to receive this Global Action Agenda. We know enough about the need for sustainable energy. Now it is time to act.

By bringing together leaders from Government, finance, business and civil society, we can establish partnerships that will make sustainable energy for all a reality. The scale of the global energy transition is too large for Governments to lead alone. Private investment and business engagement will be essential to success. Civil society organizations must help effect and sustain change.

Increasingly, such partnerships will be central to the work of the United Nations across the breadth of the Organization. That is why I plan to create a United Nations partnership facility to support multi-stakeholder engagement as a matter of priority during my second term.

The upcoming United Nations Conference on Sustainable Development is an opportunity to mobilize support for sustainable energy investments. It is an opportunity to put the world on a truly sustainable path: economically, socially and environmentally. It is our chance to connect the dots among the issues of climate change, energy, water, food, healthy oceans, gender empowerment, poverty reduction and global health, and addressing inequality. It is our chance to make growth inclusive while respecting planetary boundaries.

The United Nations Conference on Sustainable Development is not the end, but the beginning, of a multi-year mission on these issues and, especially, on sustainable energy for all. With this Global Action Agenda, let us take action to make it reality.

BAN Ki-moon
Secretary-General of the United Nations
April 2012

Foreword

This is the third of the principal documents prepared for the Secretary-General's "Sustainable Energy for All" initiative: the Secretary-General's vision statement charting our course, presented to Member States in November 2011 (A/66/645); the Framework for Action that we endorsed in January 2012;* and the present Global Action Agenda. For most advisory groups, that would mean an end. We see it as a beginning.

We agreed to take on the leadership of the Secretary-General's High-level Group on Sustainable Energy for All for one simple reason: to spark concrete international action to address the initiative's three objectives — energy access, energy efficiency and renewable energy — in an integrated way. We have reached out to Governments, businesses and civil society in designing this agenda, and we have encouraging results to report.

This Global Action Agenda recommends 11 Action Areas to help focus our efforts and mobilize commitments towards the three objectives. Each of the action areas includes a number of high-impact opportunities that Government, business and civil society can rally around.

Many developing countries have expressed interest in participating. Ghana, one of the first countries to partner with the initiative, is already developing national energy plans and programmes of action that include policy changes to help unlock private investment flow. This begins a new type of partnership between developing countries, which will support reforms to catalyse investment, and development partners, which will provide support through capacity-building, policy advice and innovative financing mechanisms.

In Brussels on April 16, José Manuel Barroso, President of the European Commission, announced a new initiative called "Energizing Development". It sets an ambitious goal: to help provide access to sustainable energy services to 500 million people by 2030. In addition, a Technical Assistance Facility will be supported with €50 million over the next two years, drawing on European Union experts to develop technical expertise in developing countries.

Many are already leading the way. In Brazil, the "Light for All" initiative has brought some 15 million Brazilians out of darkness. China has become a world leader in renewable energy. India has set an ambitious target of more than doubling its renewable energy capacity in 10 years. And the Energy+ international partnership demonstrates Norway's strong commitment to universal access to clean energy.

We have also heard from other stakeholders about their plans to announce commitments to action that will move the world more rapidly towards sustainable energy for all. For example, the Clean Energy Ministerial is promoting "game-changing" initiatives such as the Global Lighting and Energy Access Partnership. And we have heard from civil society and individuals all around the world — from the Institute of Electrical and Electronics Engineers to the rock band Linkin Park — about their desire to engage and support the vision of Sustainable Energy for All.

This is a hopeful start. But the challenge of transforming the world's energy systems will require engagement over the next two decades. The purpose of this

* See http://www.un.org/wcm/content/site/sustainableenergyforall/home/documents.

Global Action Agenda is to provide a context and guidance for that evolving work, to suggest high-impact opportunities and to attract commitments to action at the United Nations Conference on Sustainable Development and beyond — for the next 5, 10 and 20 years. The Action Agenda will continue to be refined as we move forward, through consultations facilitated through the initiative.

These actions will do much to eradicate energy poverty. They will also lead to sustainable growth, the development of new markets, the creation of new businesses and jobs, and increased global prosperity. The opportunities amount to trillion-dollar markets. We urge you to join us on this adventure.

Charles Holliday and Kandeh Yumkella
Co-Chairs of the High-level Group on Sustainable Energy for All
April 2012

Summary

Energy is the golden thread that connects economic growth, increased social equity and an environment that allows the world to thrive. Development is not possible without energy, and sustainable development is not possible without sustainable energy.

The "Sustainable Energy for All" initiative will catalyse major new investments to speed the transformation of the world's energy systems, pursue the elimination of energy poverty and enhance prosperity. The Secretary-General has launched this global initiative to mobilize all stakeholders to take concrete action towards three critical objectives to be achieved by 2030: (a) ensuring universal access to modern energy services; (b) doubling the global rate of improvement in energy efficiency; and (c) doubling the share of renewable energy in the global energy mix.

The initiative will "change the game" by introducing new public-private partnerships built from constructive dialogue on policy, investment and market development by Governments, businesses, and civil society. It brings together the global convening power of the United Nations, the ability to mobilize bold commitments and leverage large-scale investment, and a rapidly expanding knowledge network.

This Global Action Agenda charts a path forward for the initiative and its stakeholders. It also aims to help countries and stakeholders create their own pathways towards sustainable energy for all, on the basis of technology choices that are appropriate for their unique national and local circumstances. It serves as the starting point of a longer journey and is a living and evolving document that will be periodically refined.

The Global Action Agenda identifies 11 action areas for the achievement of the three objectives. These provide a framework for identifying high-impact opportunities; a way to organize multi-stakeholder actions across all relevant sectors of the economy; and tangible entry points for stakeholders interested in taking action in specific areas of interest.

The action areas include seven "sectoral" areas: (a) modern cooking appliances and fuels; (b) distributed electricity solutions; (c) grid infrastructure and supply efficiency; (d) large-scale renewable power; (e) industrial and agricultural processes; (f) transportation; and (g) buildings and appliances. There are also four "enabling" action areas: (a) energy planning and policies; (b) business model and technology innovation; (c) finance and risk management; and (d) capacity-building and knowledge-sharing.

We invite all stakeholders to take action across all relevant sectors. Each action area includes a set of high-impact opportunities that will drive transformational change. These high-impact opportunities will be addressed through actions already under way that are aligned with the objectives of Sustainable Energy for All, as well as actions that arise from new initiatives and partnerships. We seek not just the participation, but also the strong collaboration, of multiple stakeholders across all relevant sectors of the economy.

This Action Agenda will accelerate global momentum towards sustainable energy for all by linking the results of individual actions with its ambitious global objectives. Regular progress assessments will renew a dialogue about the pace and the scale of change. The initiative will facilitate a continued multi-stakeholder dialogue involving all relevant sectors to ensure that sustainable energy stays at the forefront of political attention.

The initiative will track progress towards the three objectives over time. To instigate and sustain change in the world's energy systems over the next two decades, the initiative will identify metrics to measure the progress of actions in both the short and long terms. It will also develop regular assessments of progress towards the three objectives themselves, so that it is clear how much remains to be accomplished, how individual actions are contributing and where more action is needed.

Sustainable Energy for All is a call to action for our collective future. Working together, we can achieve a broad-based transformation of the world's energy systems over the next 20 years, harnessing the power of technology and innovation in the service of the planet — for us, for our children and for generations yet to come.

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I. Transforming the world through Sustainable Energy for All

1. Energy is the golden thread that connects economic growth, increased social equity and an environment that allows the world to thrive. Access to energy is a necessary precondition for the achievement of many development goals that extend far beyond the energy sector: eradicating poverty, increasing food production, providing clean water, improving public health, enhancing education, creating economic opportunity and empowering women. The transition to sustainable energy systems also presents one of the greatest investment opportunities of the twenty-first century. In short, development is not possible without energy, and sustainable development is not possible without sustainable energy.

2. The Secretary-General of the United Nations has launched a global initiative to achieve sustainable energy for all by 2030. All stakeholders are urged to take concrete action towards three critical objectives: (a) ensuring universal access to modern energy services; (b) doubling the share of renewable energy in the global energy mix; and (c) doubling the global rate of improvement in energy efficiency (see figure I).

Figure I

Three objectives necessary for long-term sustainable development

Achieving the three objectives of Sustainable Energy for All makes many development goals possible

Ensuring universal energy access	**Doubling the share of renewable energy**	**Doubling the rate of improvement in energy efficiency**
• Improved health Improved agricultural productivity	• Affordable energy even where grid does not reach	• Lighting/ appliances that require less power
• Empowerment of women	• New opportunities for small entrepreneurs	• Fossil fuel resources used more effectively
• Business and employment creation	• Decreased variability in energy costs	• Reduced energy costs for consumers
• Economic development	• Energy security and reduced import bills	• Redistribution of electricity now being wasted or lost
• Achievement of the Millennium Development Goals	• Reduced environmental impacts	• More reliable electricity systems

3. Realizing these objectives will require a decisive shift away from business as usual. There is already growing momentum for cleaner and more efficient energy solutions that can leapfrog existing systems, much as mobile technology revolutionized telecommunications. Many Governments and businesses are acting to speed this transition. However, much more action is needed to address regulatory and infrastructure challenges within and beyond the energy sector. Establishing

enabling conditions for private investment is critical, because the market will not deliver such a shift without policies that encourage sustainable energy technologies, including, where appropriate, special assistance for low-income individuals and communities. Significant human and financial capital must be mobilized, and the private sector must be rigorously engaged. Such action must be taken urgently to counter the expected headwinds of population growth, climate change and increasing resource scarcity. Nothing less than a worldwide effort is required to accelerate the transition, given the scale of both the challenges and the opportunities.

4. The pursuit of sustainable energy for all will catalyse a transformation in the world's energy systems towards an equitable and sustainable future. It must proceed from a new spirit of dialogue and collaboration, so that energy in 2030 is much more widely shared, cleanly produced and efficiently used. Transforming the world's energy systems will lead to new multi-trillion-dollar investment opportunities to eliminate energy poverty, integrate and balance conventional and renewable energy sources, and enhance prosperity in developed and developing countries alike.

5. The Sustainable Energy for All initiative will "change the game" and add value by presenting a new pattern of partnership, built from constructive dialogue on policy, investment, capacity-building and market development by Governments, businesses and civil society (see figure II). The initiative provides an unrivalled platform to accelerate the transformation of the world's energy systems, because it brings together:

(a) A clearly articulated global vision and objectives that can orient actions and be flexibly adapted to unique local circumstances;

(b) An unparalleled convening power that will help build a common agenda, spur concerted action towards shared goals and bring about greater coordination of development assistance at the global and national levels (e.g., through the United Nations resident coordinators and the Global Compact local networks);

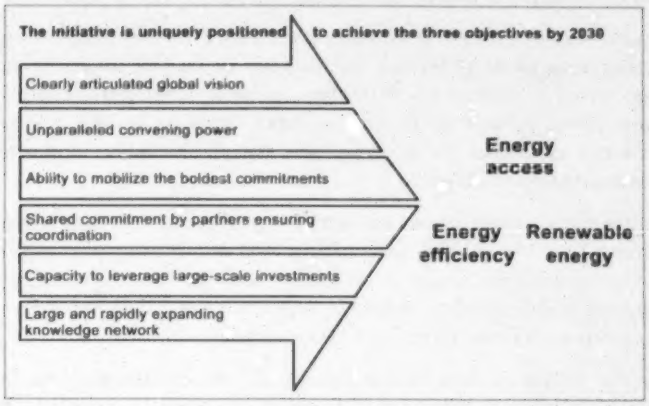
(c) The ability to mobilize bold commitments engaging the broadest range of possible stakeholders to work towards a defined global vision and nationally tailored objectives;

(d) A shared commitment by all partners that ensures the highest degree of coordination to effectively identify synergies and foster multi-stakeholder partnerships to address collective action problems across all relevant sectors of the economy;

(e) A capacity to leverage large-scale investment by fostering the enabling conditions for success, including innovative approaches to mitigate risk, and tapping into a broad array of businesses and financiers;

(f) A large and rapidly expanding knowledge network to identify and disseminate successful ideas and establish multiple communities of practice.

Figure II
Value proposition of the Sustainable Energy for All initiative


The initiative is uniquely positioned
to achieve the three objectives by 2030
Clearly articulated global vision
Unparalleled convening power
Ability to mobilize the boldest commitments
Shared commitment by partners ensuring coordination
Capacity to leverage large-scale investments
Large and rapidly expanding knowledge network
Energy access
Energy efficiency
Renewable energy

6. The initiative embraces a set of guiding principles that steer its operation. These include: the full inclusion of all parties, collaboration to catalyse action at all levels, transparency on the part of all stakeholders on commitments made, the dissemination of lessons and best practices, and the acceptance of a diverse range of approaches, including technology choices based on unique national and local circumstances.

7. The present document charts a path forward for the initiative and its stakeholders by identifying critical action areas and providing a road map for next steps.[1] It also aims to help countries and stakeholders create their own pathways towards sustainable energy for all. It is the starting point of a longer journey, a living and evolving document that will be periodically refined. As the initiative proceeds, actions are implemented and lessons are learned, the high-impact opportunities identified herein will be modified, strategies updated and new milestones pursued.

II. Action areas

8. To realize a future with sustainable energy for all, leadership is needed from all stakeholder groups across many relevant sectors of the economy. Progress depends on recognizing the interconnectedness of these stakeholders:

(a) National Governments must design and implement a set of integrated country actions to drive transformative change in the world's energy systems. To spur investment, action is needed to create national policy and financial environments that enable change which the market alone will not deliver. This applies to both

[1] The Global Action Agenda builds on the foundation of previous documents prepared by the Secretary-General's High-level Group on Sustainable Energy for All. The Secretary-General's vision statement presents the case for change and defines the initiative's three objectives. The Framework for Action identifies the value of participation for each major stakeholder group, the benefits of stakeholder collaboration, the structure of the commitment process and the guiding principles of the initiative. In addition, the Action Agenda is informed by the work of its task forces, including their technical reports, which detail the rationale for action on each objective and reflect the best practices of businesses engaged in the Global Compact.

developing and developed countries, although the challenges to be overcome in each case may be substantially different. Business and civil society should be engaged in the preparation of these plans and programmes;

(b) Private sector leadership is also fundamental to the initiative, given the role of businesses as solution providers and primary drivers of investment. Most of the action areas involve technology providers, project developers, energy utilities and service providers, providers of finance, and users of energy resources and services. As energy is crucial to business activity, the business opportunities in leading the transformation are clear;

(c) Civil society organizations are needed to effect and sustain change. Their role is fundamental in identifying, advocating and monitoring public policy and business action; mobilizing social innovation and grass-roots action; leading behavioural change; and helping to spread best practices and building capacity at all levels in partnership with Governments and businesses.

9. To make the vision of Sustainable Energy for All actionable, the three core objectives have been disaggregated into 11 action areas (see figure III). These are intended to provide:

(a) A framework for identifying high-impact opportunities and cataloguing existing and potential initiatives that can further the three objectives;

(b) A way to organize multi-stakeholder actions across all relevant sectors of the economy towards the objectives;

(c) A tangible entry point for stakeholders interested in taking action in specific areas of interest.

Figure III
From vision to initiatives

10. The 11 action areas are synthesized from the work of the initiative's task forces.[2] Together, they address almost 95 per cent of global energy consumption, key components of productive energy use and the supporting mechanisms needed to overcome the most common impediments to action. They also aggregate in coherent groups the high-impact opportunities that the task forces identified.[3]

11. The action areas are grouped into two categories — sectoral and enabling:

(a) The seven sectoral action areas address both power generation (40 per cent of total primary energy demand in 2009) and the three principal sectors of energy consumption — industry and agriculture, transport and buildings — each of which accounts for roughly one third of total energy consumption. The International Energy Agency (IEA) projects that each of these sectors will account for a similar share of total primary energy demand in 2030;

(b) The four enabling action areas include cross-cutting mechanisms designed to support effective sectoral action, address existing obstacles and catalyse rapid scaling.

12. Together, the 11 action areas form a platform from which progress can be made across all linkages to achieve the three objectives of Sustainable Energy for All (see figure IV).

Figure IV
Action areas support economic sectors and foster an enabling environment for progress

Sectoral action areas

A. Modern cooking appliances and fuels
B. Distributed electricity solutions
C. Grid infrastructure and supply efficiency
D. Large-scale renewable power
E. Industrial and agricultural processes
F. Transportation
G. Buildings and appliances

Enabling action areas

W. Energy planning and policies
X. Business model and technology innovation
Y. Finance and risk management
Z. Capacity-building and knowledge-sharing

[2] The task forces, comprising members of the High-level Group and technical advisers, were asked to elaborate on the rationale for action on each objective. For a detailed discussion of each action area, refer to the illustrations included in section V.

[3] Task force 1 focused on steps to achieve the energy access objective. Task force 2 assessed opportunities for advancing the energy efficiency and renewables objectives. Task force 3 engaged the business network of the High-level Group and the Global Compact to compile best practices. Task force 4 identified opportunities and strategies for public engagement and communications.

13. Each action area includes many high-impact opportunities for change:

(a) The Action Agenda encompasses existing initiatives that are aligned with the objectives of Sustainable Energy for All, as well as initiatives that arise from new commitments to action;[4]

(b) Members of the High-level Group and new partners are expected to lead by example; e.g., by developing initiatives to address high-impact opportunities and mobilizing other stakeholders to join their efforts.

14. Each of the seven sectoral action areas supports one or more of the three main objectives:

A. **Modern cooking appliances and fuels:** providing access to modern energy services for those who lack clean and efficient equipment such as stoves and fuels;

High-impact opportunities: building sustainable local value chains for clean and efficient cooking solutions; building market demand for such solutions by raising awareness of their health, economic, environmental and gender benefits; investing in the infrastructure and local distribution supply chains required for cleaner fuels (e.g., ethanol and liquefied petroleum gas (LPG)); developing tiered standards for efficiency, emissions and safety; and designing cooking appliances that meet consumer needs and price points;

B. **Distributed electricity solutions:** providing access to electricity through off-grid, micro- and mini-grid solutions, including targeted applications for productive uses;

> *Example*
>
> The "Lighting a Billion Lives" initiative aims to bring light into the lives of people in rural areas, in India and across the world, by replacing kerosene lamps and candles with solar lighting devices and by providing livelihood opportunities at the individual and village levels.

High-impact opportunities: clean energy mini-/micro-grid solutions for rural and targeted industrial applications, using both renewables and conventional sources; locally appropriate regulatory frameworks to incentivize and support commercially viable investments in decentralized electricity solutions; the deployment of off-grid renewables and lighting and charging systems, including solar lighting; and self-contained systems that provide uninterrupted power when the grid fails;

C. **Grid infrastructure and supply efficiency:** extending the electricity grid and increasing the efficiency of energy generation, transmission and distribution;

[4] Commitments to action, in the context of the Sustainable Energy for All initiative, broadly refer to steps that will advance the Global Action Agenda. Commitments to action can take many forms, including policies, projects, programmes, products, services, knowledge-sharing and direct financing, as well as partnerships to drive investment. These commitments should be well specified and should accord with the initiative's guiding principles, including transparency and accountability.

Example

The "Sustainable Development of Hydropower" initiative engages Governments and private sector participants to promote the sharing of expertise, best practices and methodologies related to the sustainability and financing of hydropower, as well as to motivate multilateral developing and financing agencies to consider sustainable hydropower in the portfolios of possible energy solutions for developing countries.

High-impact opportunities: traditional grid expansion to unconnected areas; strengthening transmission and distribution networks to reduce losses and improve reliability; regional interconnections to improve performance; improving the efficiency of existing conventional energy generation and interaction between fossil and non-fossil fuels; smart grid technology solutions and grid-scale storage; and the redesign of existing plants and networks to facilitate long-distance transmission in a more volatile supply-and-demand environment;

D. **Large-scale renewable power:** accelerating the build-out of grid-connected renewable energy solutions and the associated transmission and distribution infrastructure;

High-impact opportunities: onshore and offshore wind, solar photovoltaics (PV), solar thermal, concentrating solar power, geothermal, hydropower and bioenergy, along with specific policies and business models to support them (e.g., grid access, feed-in tariffs, portfolio standards and public auctions);

E. **Industrial and agricultural processes:** improving production efficiency, both directly and in the supply chain, and converting from chemical to biological feedstocks;

Example

The Global Gas Flaring Reduction Partnership brings oil-producing countries, state-owned companies and international oil companies together to discourage the practice of flaring natural gas. The partnership works to overcome barriers to change by sharing best practices and implementing country-specific programmes, promoting effective regulatory frameworks, and tackling constraints on gas utilization.

High-impact opportunities: the elimination of gas flaring and the development of local gas markets; variable-speed motors; energy management practices and systems (e.g., in the cement and steel industries); the conversion of waste to energy; improved process and system design; cogeneration systems (combined heat and power); renewable desalination; energy-efficient irrigation pumps; and energy-smart agriculture;

Example

The Global Bioenergy Partnership brings together public, private and civil society stakeholders in a joint commitment to promote bioenergy for sustainable development. The Partnership focuses its activities in three strategic areas: sustainable development, climate change and food and energy security.

F. **Transportation:** increasing fuel efficiency for all classes of vehicles; increasing the share of renewables in the fuel supply; alternatives to personal vehicles and freight transport; and public-transit-oriented urban development;

High-impact opportunities: efficiency programmes for internal combustion engines and vehicle design; alternative-fuel vehicles, including flex-fuel, hybrid and electric vehicles; new power trains for alternative fuels; the use of renewable fuels; fuel efficiency and fuel quality standards; overall transportation demand reduction; "eco-driving" programmes; expanded and more efficient public transport; the electrification of rail systems; and freight mode shifting (e.g., from trucks to trains);

G. **Buildings and appliances:** improving efficiency through the proper design, insulation and retrofitting of buildings and incorporating renewable self-generation options where feasible, together with more efficient consumer appliances and equipment;

Example

The "Super-efficient Equipment and Appliance Deployment" initiative of the Clean Energy Ministerial engages Governments and private sector participants to promote more efficient products through incentives, procurement and awards; bolster regional efficiency standards and labels; and strengthen coordinated technical analysis to identify cost-effective efficiency opportunities.

High-impact opportunities: public/residential/commercial buildings, "cool roofs", the building of integrated solar PV, and small-scale renewables such as rooftop solar and solar hot water; sectoral efficiency labels and performance standards; well-enforced building codes; demand-side management programmes and advanced technologies to enable energy-saving behaviour and shift demand across time; advanced lighting, space cooling and heating and refrigerators; and the wider adoption and enforcement of regional minimum efficiency standards and comparable test procedures by industry and local governments.

15. The four enabling action areas include cross-cutting mechanisms that support the sectoral action areas at the country, regional and local levels:

W. **Energy planning and policies at all levels:** promoting direct public action and improving the legal and administrative context for successfully engaging the private sector and civil society;

> *Example*
>
> Renewable readiness assessments by the International Renewable Energy Agency allow national Governments to assess and create clear and transparent policy frameworks and to develop the institutional capacity and strategies required to support the deployment of renewable energy technologies. The methodology was applied to two countries in 2011 and will be further rolled out in 2012.

High-impact opportunities: reviewing and updating national energy targets and plans, including those for energy access, renewables and efficiency; and creating stable policy environments, institutional frameworks and governance, and policies that support private investment in sustainable energy technologies;

> *Example*
>
> The Energy+ international partnership, started by Norway in 2011, aims to increase energy access at scale and reduce greenhouse gas emissions in developing countries by applying a sector-level approach that leverages private capital and carbon market financing. It is creating technical, policy and institutional frameworks that a country needs to access private financing for low carbon development.

X. **Business model and technology innovation:** developing new approaches to overcome barriers that have impeded the deployment of sustainable energy services and technologies in the past, deliver affordability and reliability, and develop incentives for innovation;

High-impact opportunities: models for delivering modern energy services that do not involve the national electricity network; public-private partnerships with local utilities; matchmaking between small enterprises and international companies in niche markets; support for start-ups and small and medium-sized enterprises in achieving scale; consumer credit for energy and appliances; technology innovation policies, including funding for research and development, demonstration projects, and knowledge and technology transfer; technology adaptation; and payment plans that overcome consumer resistance to the high up-front costs of energy-efficient products through energy savings.

Y. **Finance and risk management:** promoting instruments to reduce risk and increase private investment in sustainable energy through the targeted use of public and philanthropic capital;

Example

The European Commission's "Energizing Development" initiative aims to provide access to sustainable energy services for an additional 500 million people in developing countries by 2030.

High-impact opportunities: political and regulatory risk insurance, loan guarantees, first-loss coverage, subsidies and tariffs; advance commitments for technology innovation; linkage of small and medium-sized enterprises with local financial institutions; energy savings performance contracting; Government procurement of new and existing technologies; climate finance and consumer credit; and mechanisms to mitigate energy price volatility.

Z. **Capacity-building and knowledge-sharing:** developing human and institutional capacity and adopting successful strategies proven elsewhere for faster replication across the world;

Example

The Clean Energy Solutions Centre shares policy best practices, data and analytical tools across countries and serves as a first-stop clearing house for clean energy resources. It offers customized policy assistance through direct, no-cost access to experts and online training, to help countries tailor solutions to their needs and foster international collaboration on policy innovations.

High-impact opportunities: global and regional energy resource mapping; a best practices database; institutional support for local governments; the training of policymakers and maintenance and installation engineers; policy and operational toolkits; and a technical assistance facility for the development of energy access plans and projects.

16. Success in each action area will require not just the participation, but also the collaboration, of multiple stakeholders across all relevant sectors of the economy. Governments, businesses and civil society organizations all have important and complementary roles to play; how they participate will vary, depending on the action area concerned. Set out below are representative examples of the types of engagement expected from each stakeholder group:

(a) The Governments of developing countries must create conditions that enable growth by establishing a clear vision, national targets, policies, regulations and incentives that link energy to overall development, while strengthening national utilities. Institutional frameworks have to be put in place to ensure transparency and a high degree of predictability as preconditions for attracting private investment. They should also build on existing national plans to advance energy access and promote efficiency and renewables in ways that respond to national circumstances and priorities. For example, one country might commit to improving the efficiency of cookstoves and supporting the safe and sustainable sourcing of modern fuels for domestic use, while another might commit to facilitating the development of grid-scale geothermal power;

(b) The Governments of developed countries must focus internally on efficiency and renewables while externally supporting all three objectives through international action. They can elaborate on current plans to increase the deployment of domestic renewable energy and improve energy efficiency through the entire value chain, from the production of primary energy through the use of energy services. They can also provide public capital for technical assistance to support pilot projects or demonstrations or to fund instruments that reduce private sector risk. All of these strategies can be used both to drive domestic action and to support developing countries;

(c) Regional and local governments are very important players. Cities already account for three quarters of total final energy consumption and half of the world's economic output; if current trends continue, 65 per cent of the world's population will be living in urban areas by 2030. In this context, regional and local governments, urban planners and transportation authorities can have a great impact on the future of sustainable energy. They can design policies and investments to encourage the greater use of public transit, promote bicycling and walking or speed the adoption of alternative-fuel vehicles by investing in refuelling infrastructure. Governments can also invest in the retrofitting of public buildings, which represent more than half of the total building stock, which, it is estimated, will consume 40 per cent of global energy by 2030;

(d) Donors and multilateral institutions are critical to the mobilization of large amounts of resources for country action. They can provide technical assistance and policy guidance, support knowledge and capacity-building and share best implementation practices, as well as make direct financial investments. For example, a multilateral bank could work to strengthen local financial institutions in order to stimulate investment in energy access and clean energy pro[illegible]ts;

(e) Businesses will have different roles to play, depending not only on the action area being addressed, but also on their size, the type of product or service that they provide and the value proposition that presents itself. Large international corporations can take the lead in their own sectors; e.g., by mobilizing their industries to common action. For example, an automaker could lead an initiative to accelerate the adoption of electric vehicles, while a leading LED manufacturing company and a solar panel manufacturer could jointly undertake a solar lantern initiative with a smaller local business that has experience in delivering products and services to rural communities. Financial services companies can offer guidance to Governments on policies to increase private sector investment, and then raise or provide targeted financing for initiatives that will generate returns, or could partner with energy service companies that share the performance and/or the credit risk. Technology companies can undertake research and development to bring forward new technologies or adapt existing ones to new circumstances. All companies, large and small, can make commitments to increase their energy efficiency and use of renewables in their own operations and supply chains;

(f) Civil society organizations are well positioned to make use of their unique flexibility, focused mission and, often, their proximity to the energy-poor to promote community dialogue, engagement and support. Leading global organizations can participate in multi-stakeholder sectoral initiatives, either individually or in collaboration with businesses. In the transport sector, for example, civil society organizations could lead a global campaign on "eco-driving" to change

driver behaviour. To spur capacity-building, such organizations can provide training programmes to help communities implement sustainable energy initiatives, such as the electrification of villages using solar power; they can also identify critical gaps in technology and the supply chain and help to address them. Where mini-grid or off-grid solutions are appropriate, civil society organizations can offer innovative mechanisms to lower up-front costs to consumers, and develop business models and supply chains that attract investment, delivering energy access in areas where fully commercial approaches lag behind.

17. Collaborations among these stakeholders will take many different forms and cut across all sectors. Examples could include international financial institutions providing risk guarantees to private investors; policymakers and civil society groups working together to set standards and ensure product quality; mobile-phone companies partnering with national utilities to make electricity affordable to the very poor; transportation and urban planners jointly designing low-carbon cities; and volunteer experts around the world sharing best practices with policymakers new to the field. The opportunities are as diverse as are the ways to produce and use energy.

III. Implementation road map

Making it happen: metrics of progress

18. The Sustainable Energy for All initiative seeks to improve the lives of billions of people across the world and ensure a more sustainable future by transforming the world's energy systems. Because access to energy is an essential means of supporting societal progress, rather than an end in itself, such an energy transformation must be coordinated with social, economic and environmental development.

19. Achieving this transformation by 2030 requires both short-term and long-term progress metrics:

(a) The short-term need is to raise the global profile of the initiative. This can be achieved by mobilizing a set of "first-mover" countries, along with commitments to action from leading businesses, to show what is possible;

(b) The long-term need is to establish an effective coordination structure that can sustain momentum over the next two decades and mainstream the initiative's core objectives into political and business decisions.

20. Metrics of progress should cover both the action areas and supporting activities (see tables 1 and 2). They must be fully developed going forward and should be designed to promote transparency with regard to the initiative's progress, while also engaging the global public. Indicators of progress could include:

(a) Accelerating country action, as measured by participation, policy and regulatory change, and the number of additional beneficiaries;

(b) Driving sectoral action, as measured by the number of stakeholders and the resources mobilized for high-impact opportunities, as well as the coverage and diversity of actors and initiatives;

(c) Developing enabling action, as measured by the amount of private investment leveraged by the public resources, the level of capacity developed and the extent of knowledge-sharing.

Supporting activities indicators could include:

(d) Promoting accountability and transparency based on the regular monitoring of progress through simple but credible success metrics;

(e) Mobilizing global public engagement by raising awareness about the objectives of Sustainable Energy for All and continually expanding outreach to stakeholders.

Table 1
Illustrative action area metrics towards sustainable energy for all

Action area	*Immediate term (by the United Nations Conference on Sustainable Development)*	*Short term (to 2015)*	*Longer term (2015 to 2030)*
Country action	**Developing countries:** development/updating of national energy action plans initiated **Developed countries:** political support mobilized for domestic and international action towards the objectives of the "Sustainable Energy for All" initiative	**Developing countries:** • National and regional energy action plans in place to achieve tailored objectives • National capacities and policies strengthened for investment readiness • Active energy programmes in place with sufficient investment **Developed countries:** • Policies and programmes in place to make progress towards tailored objectives	**Appropriate policies**, legal, fiscal and regulatory frameworks, and standards implemented at all levels and across all sectors to achieve nationally tailored objectives **Significant number of people with newly gained access** to modern energy services
Sectoral action	**Flagship initiatives** initiated in each action area, led by multiple stakeholders (businesses, civil society organizations, Governments)	**Measurable progress** on flagship initiative **Substantial growth** in the number of actions under way **Key cross-sectoral opportunities** identified (e.g., water and energy) **Increasing uptake** by small and medium-sized enterprises/grass-roots civil society organizations/local governments/municipalities	**Initiatives** incorporated into continual improvement process **Growing investment** (all areas) **Institutional and financial capacity** to sustain efforts continually strengthened

Action area	*Immediate term (by the United Nations Conference on Sustainable Development)*	*Short term (to 2015)*	*Longer term (2015 to 2030)*
Enabling action	**Resources** committed to enable country actions and flagship activities (including technical assistance resources) **Knowledge management networks**/infrastructure designed	**Predictable financing instruments** established to support initiatives requiring public/donor finance **Knowledge management networks** in place, including global best practice databases and tools enhanced for easy access **Ready access to experts** to provide technical support for policy creation	**Private financing** leveraged by public resources, commensurate with the level required for meeting Sustainable Energy for All objectives at all levels

Table 2
Illustrative supporting activities metrics toward Sustainable Energy for All

Supporting activities	*Immediate term (by the United Nations Conference on Sustainable Development)*	*Short term (to 2015)*	*Longer term (2015 to 2030)*
Accountability and monitoring mechanisms	**Accountability framework** in place to measure progress of individual initiatives and overall objectives	**Tracking/publishing of progress** by all participating stakeholders (i.e., governments, businesses and civil society organizations) **Transparent and accessible platform** in place for self-reporting on fulfilment of commitments to action	**Institutional feedback loops** created between the monitoring and reporting of progress and strategic planning processes **Progress updates** incorporated into routine reporting processes
Public engagement	**Messaging developed** and awareness campaign launched	**Increased web presence,** continued growth in public awareness	**Targeted effort launched** to reach groups in need of specific support

Accelerating global momentum

21. The Sustainable Energy for All initiative will sustain and accelerate global momentum if individual actions at all levels can be effectively linked with its ambitious global objectives. To maintain momentum and focus, two activities are needed: (a) tracking global progress towards the three core objectives; and (b) using regular assessments to spark continued global dialogue.

22. Both stakeholders and observers must be able to assess global progress and measure and recognize success at all levels of the "vision pyramid" (see figure III).

Such assessments can be built on existing data collection, reporting processes and initiatives to improve measurement tools (e.g., by IEA, the World Bank, the Energy Sector Management Assistance Programme and the United Nations), but more data are needed. Tracking and meeting the progress metrics discussed above will ensure that the initiative is moving forward. Individual commitments to action and high-impact opportunities will have their own milestones. At the same time, and more important, an overall assessment of progress towards the three objectives — energy access, share of renewables and rate of energy efficiency improvement — will be needed so that it is clear where we stand, how much remains to be accomplished, how individual actions are contributing and where more action is needed. This assessment should be carried out at two levels:

(a) At the global level, disparate analyses will need to be assembled and consolidated to assess the reach of energy access, the share of renewables and the rate of improvement of energy efficiency to assess whether the world is on track to achieve the objectives of Sustainable Energy for All. Such global tracking can be presented visually (e.g., through a "ticker");

(b) At the action area level, specific metrics will need to be used to assess whether sufficient progress is being made relative to the potential contribution of each action area, and highlighted on knowledge-sharing platforms.

23. Tracking progress towards sustainable energy for all will prompt a continued global dialogue. Each global progress assessment will renew debate about the pace and the scale of change. The Sustainable Energy for All initiative must facilitate this conversation at all levels and across all stakeholders. Doing so will ensure that the initiative continues to draw the focused attention and discourse of Governments, the private sector and civil society.

24. This continued dialogue will provide a basis for the regular updating of the Action Agenda, which should be viewed as a living and evolving document. Results of the global assessment will enable participants and other stakeholders to revisit the Action Agenda and refine and steer its priorities to address changing needs at the national and global levels, helping to ensure that the initiative remains relevant and effective from now until 2030.

Supplying modern energy services to the billions who now lack electricity and clean fuels is not just a moral imperative but a unique business opportunity — a huge market in itself and one that will create new levels of prosperity and demand for goods and services of all kinds.

Charles Holliday and Kandeh Yumkella
Co-Chairs of the High-level Group on Sustainable Energy for All

We need innovation to spread throughout the world — especially where energy demand is growing fastest. We need partnerships with the private sector, the global engine of growth and the primary source of new investments.

BAN Ki-moon
Secretary-General of the United Nations

IV. Mobilizing action

25. Mobilizing action from all stakeholders is at the heart of the Sustainable Energy for All initiative, since only engaged stakeholders can take the concrete steps needed to achieve the three core objectives. Thus, the success of the initiative hinges on its ability to secure commitments to action, effect changes in the parameters for action, and promote successful outcomes through effective and transparent accountability mechanisms. The Secretary-General will use his convening power to mobilize action by stakeholders and build and leverage a global network to drive the initiative.

26. Members of the High-level Group and their partners are reaching out to their sectoral and geographic networks to catalyse and accelerate collaborative action and bring scale to the process. In the short term, the focus is on engaging a wide variety of global stakeholders to make commitments to action on high-impact opportunities. In addition, the Global Compact is involving a large number of companies and relevant industry associations through their global and national networks. These efforts seek to strengthen existing initiatives by all partners to mainstream sustainable energy concerns into their programmes, identify new opportunities, and develop individual actions and collaborative partnerships for action.

27. Scaled-up efforts to achieve sustainable energy for all will require effective coordination capacity at the global and national levels, as well as specific actions, to ensure continued engagement and effective delivery throughout the life of the initiative. Operational arrangements should leverage existing institutional structures, taking full advantage of available delivery mechanisms and the diverse capacities of a network of partners, including international organizations, businesses and civil society organizations. Key functions to be addressed include strategic planning; facilitating multi-stakeholder dialogue; coordinating country action and high-impact opportunities; supporting policy analysis, knowledge management, technical advisory services and communications; monitoring, reporting and accountability; and mobilizing partnerships and resources. Such operational arrangements need to be formalized in the short to medium term to support continued engagement over the life of the initiative.

28. Achieving the three objectives is within reach if all stakeholders come together and act. This Action Agenda builds on an emerging groundswell of international support for change. Governments, businesses and civil society organizations have already taken important steps. The Sustainable Energy for All initiative will ensure that these leaders are joined in a broader global movement to provide economic opportunity, protect the global environment and enhance equity.

29. Sustainable Energy for All is a call to action for our collective future. Working together, we can achieve a broad-based transformation of the world's energy systems over the next 20 years and build a better world for our children and for generations yet to come.

V. Action area illustrations

Sectoral action areas

A. Modern cooking appliances and fuels
B. Distributed electricity solutions
C. Grid infrastructure and supply efficiency
D. Large-scale renewable power
E. Industrial and agricultural processes
F. Transportation
G. Buildings and appliances

Enabling action areas

W. Energy planning and policies
X. Business model and technology innovation
Y. Finance and risk management
Z. Capacity-building and knowledge-sharing

30. This section describes the action areas in more detail, which objectives they primarily address and what set of key actions they include. For each area, examples of high-impact opportunities are presented, around which actions can be mobilized and coordinated for maximum impact. High-impact opportunities can take the form of technology development and deployment, policies, institution-building or the removal of barriers. New high-impact opportunity areas will be added when and as needed. Lastly, examples of existing initiatives are provided, linked to one or more high-impact opportunities. These examples illustrate the kinds of actions, investments and stakeholder engagement that the Sustainable Energy for All initiative seeks to catalyse and build upon. These examples are not meant to be comprehensive; rather, they are presented for illustrative purposes only, mainly on the basis of contributions of members of the High-level Group.

31. The section should be used as a tool:

(a) For Governments, to provide a diagnostic assessment of what areas their countries have already addressed and to identify where further action can be taken;

(b) For businesses, to spot opportunities for action and investments;

(c) For civil society organizations, to identify opportunities for renewed focus and effort, coordination with other stakeholders and the scaling-up of existing programmes.

A. Modern cooking appliances and fuels

Context

32. The action area "modern cooking appliances and fuels" supports the initiative's objective of ensuring universal access to modern energy services for the 2.7 billion people who currently rely on polluting and inefficient stoves and fuels for cooking. Increased deployment and use of clean and efficient stoves and fuels will save lives, improve livelihoods, empower women and combat climate change.

33. This action area includes all options that enable households to shift to cleaner fuels and stoves, including cookstoves using cleaner fuels such as biogas, solar, ethanol, propane or LPG and advanced biomass cookstoves. Expanding access to clean cooking fuel leads to a four- to five-fold increase in energy efficiency for cooking services. The IEA *World Energy Outlook 2011* estimates that $74 billion in cumulative additional investment will be needed to provide universal access to modern cooking facilities by 2030. The report estimates that such stoves will burn biogas (approximately 50 per cent), LPG (approximately 25 per cent) and biomass (approximately 25 per cent).

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
A1. **Develop industry standards for efficiency, safety and emission reduction, based on testing and certification** Primary stakeholders: Global Alliance for Clean Cookstoves and stove manufacturers	■		■	
A2. **Advocate for and educate consumers about the importance and the health, economic, environmental and gender benefits of clean cooking through capacity-building, awareness campaigns and women's networks**	■			■
A3. **Develop more efficient stoves and design products that meet consumer demand** Primary stakeholders: stove manufacturers, women's groups and researchers	■	■		
A4. **Implement policy frameworks, train entrepreneurs and develop sustainable value chains and robust infrastructure for clean and efficient cookstoves and fuels**			■	
A5. **Develop financing schemes to provide credit to households that cannot afford the up-front costs of efficient biomass stoves, LPG burners and other modern cooking equipment**			■	

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

34. Examples of initiatives that could fall into this action area are: the African, Caribbean and Pacific States-European Union (ACP-EU) Energy Facility and the

Global Alliance for Clean Cookstoves, led by the United Nations Foundation, which has six objectives: (a) catalyse the sector and broker partnerships; (b) promote international standards and testing; (c) champion the issue; (d) coordinate sector knowledge and research; (e) enable markets; and (f) mobilize resources.

B. Distributed electricity solutions

Context

35. The action area "distributed electricity solutions" supports the initiative's energy access objective for the 1.3 billion people who currently lack access to electricity and for another billion people who have power only intermittently. It complements the action area "grid infrastructure and supply efficiency".

36. This action area includes all distributed options for electrification, which range from island-scale grid infrastructure to mini-grids to much smaller off-grid decentralized individual household systems. Ultimately, some of these systems may be connected to the grid. Distributed electricity solutions are essential for those regions that rely on fuel imports for energy (e.g., islands) and will not be connected to the grid in the foreseeable future. Experience has shown that the best progress has been made in developing countries that have pursued strategies and policies to expand access to all (both urban and rural communities) by including the full range of electrification options in a balanced way. *World Energy Outlook 2011* concludes that grid extension is the best option for achieving universal access in all urban areas but in only 30 per cent of rural areas. IEA projects that approximately 45 per cent of the additional connections needed for universal access will come from grid expansion, while the remaining 55 per cent will depend on micro-grids and off-grid solutions.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
B1. **Provide regulatory support for scalable and sustainable business and financial models for such options as:**	■			
• **Solar home system development and deployment (including consumer financing)**	■			
• **Clean energy mini-/micro-grid solutions using both renewables and conventional sources for rural applications, health-care settings, solar-powered street lighting and energy for small business and agricultural purposes**	■			
• **Lighting, charging, and basic electrification**	■			
• **Self-contained systems that provide uninterrupted power when the grid fails**	■			
B2. **Recognize consumer needs and provide distributed electricity solutions that support productive use and economic development through local business creation**			■	■
B3. **Train local citizens to sell and service distributed electricity solutions and create viable supply chains for upgrading and maintenance**			■	■

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
B4. **Develop and implement small-scale renewable energy and smart grid solutions for areas where conditions do not allow for large-scale interconnected grids, such as islands or remote areas**	■		■	
B5. **Develop minimum national and regional performance standards for energy products, based on Government testing, labelling and certification** Primary stakeholders: Governments and manufacturers	■		■	

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact
□ Some impact

37. Examples of initiatives that could fall into this action area are: the Global Lighting and Energy Access Programme (LEAP); Lighting Africa and Lighting Asia, driven by the World Bank and the International Finance Corporation (IFC); the "Lighting a Billion Lives" initiative of the Energy and Resources Institute; the World Bank's Renewable Energy for Rural Economic Development programme in Bangladesh and Sri Lanka; regional development banks' distributed energy projects, including those promoted under the "Energy for All" initiative by the Asian Development Bank (ADB) and the African Development Bank (AfDB) as part of the Scaling-Up Renewable Energy Programme in Low Income Countries; the ACP-EU Energy Facility; the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project of the United Nations Development Programme/Global Environment Facility; the Climate Institute's Global Sustainable Energy Islands Initiative; the International Renewable Energy Agency (IRENA) Initiative on Renewables and Islands; and the Small Island Developing States Sustainable Energy Initiative.

C. Grid infrastructure and supply efficiency

Context

38. The action area "grid infrastructure and supply efficiency" supports the initiative's energy access objective for the 1.3 billion people who currently lack access to power and for another billion people who have power only intermittently. It is also critical to the delivery of "large-scale renewable power". In addition, it complements the action area "distributed electricity solutions" and advances the energy efficiency objective in the electricity supply sector.

39. This action area includes: the expansion of grid infrastructure to areas or people lacking access to electricity; the reinforcement of transmission and distribution infrastructure to reduce losses and improve reliability; measures that increase the *efficiencies of energy generation and supply infrastructure* (e.g., improving the thermal efficiency of power plants); and smart grid solutions and grid-scale storage that improve the efficiency of advanced grids. *World Energy Outlook 2011* of IEA concludes that centralized grid extension is the best option for achieving universal

access in all urban areas but in only 30 per cent of rural areas. IEA projects that roughly 45 per cent of the additional connections needed for universal access will come from grid expansion, while the remaining 55 per cent will depend on micro-grids and off-grid solutions.

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
C1. **Improve capabilities and methodologies to make informed assessments of optimal grid infrastructure coverage, expansion and reliability to serve local circumstances**	■	■	■	□
C2. **Develop and disseminate existing and new approaches and equipment for expanding the grid to larger areas in a cost-efficient manner, while also strengthening and improving the reliability of existing infrastructure** Primary stakeholders: utilities, technology providers	□	□	■	
C3. **Improve smart grid technology solutions, grid-scale storage and interactions between renewables and fossil fuels to reduce grid losses and support generation from intermittent renewable resources and new load patterns from consumers** Primary stakeholders: technology providers, utilities	■		■	□
C4. **Build sufficient local and regional implementation capacity to expand grid to new areas and reinforce it where demanded**	■	□	■	□
C5. **Expand national/regional integration of generation and transmission projects**	■	□	■	□
C6. **Establish efficiency targets for existing and new generation assets and develop technologies and approaches to reach them** Primary stakeholders: Governments, utilities, technology providers	■		■	□
C7. **Support forecasting of renewable power sources to facilitate integration into the grid and plan for environmentally and economically efficient back-up capacity**	■		■	□
C8. **Implement transparent transmission/distribution costing mechanisms that drive energy efficiency, and offer a level playing field for connecting energy sources to the grid**	■		■	□

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

40. Examples of initiatives that could fall into this action area are: the Energy for All initiative of ADB (also working on clean cooking and off-grid power); the European Union-Africa Infrastructure Trust Fund and several rural access projects of the World Bank in Africa; examples of successful grid expansion in many countries (e.g., Brazil, China, South Africa and Viet Nam); the Programme for Infrastructure Development in Africa; and regional transmission projects being proposed across Africa.

D. Large-scale renewable power

Context

41. The action area "large-scale renewable power" supports the Secretary-General's objective of doubling the share of renewable energy in the global energy mix. Large grid-scale power transmission is essential, especially in those regions where electricity demand growth is located away from the most abundant renewable resources. Currently, 19 per cent of the world's electricity generation comes from renewable sources (primarily hydropower).

42. The investments needed for this action area are so substantial that the private sector and global financial markets must play a key role. Enabling policy frameworks are critical to making these investments happen.

43. This action area includes: options for accelerating the deployment of all renewable technologies, such as onshore and off-shore wind, solar PV, solar thermal including concentrating solar power, geothermal, hydro and biomass; the research and innovation needed to continue pushing down the cost of those technologies; specific policies and business models to support them (e.g., feed-in tariffs and public auctions); and the removal of barriers to large-scale renewables.

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
D1. **Improve and disseminate resource assessment methodologies and develop technical assistance capacity to help countries map resource availability and develop expansion plans**	■		■	■
D2. **Share and develop innovative, increasingly cost-effective design and deployment approaches** Primary stakeholders: technology providers			■	
D3. **Craft robust renewables policies and power-price purchase agreements on which renewables developers, utilities and business can rely**	■			
D4. **Coordinate grid-connected infrastructure strategies so that different renewable energy project developers do not run into the same barriers**	■		■	
D5. **Develop capacity for installation, operation and maintenance to ensure long-term technical and economic success**	■		■	
D6. **Adopt procurement policies and targets that stimulate demand for renewables**	■		■	
D7. **Develop checklists and toolboxes that allow national policymakers to effectively address the different procedural aspects required to introduce large-scale renewables into the grid**	■	■		■
D8. **Develop monitoring and best-practice-sharing facilities and similar mechanisms to spur progress**	■	■		■

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

44. Leading examples of renewables scale-up efforts can be found across many developed and developing countries and regions. In developing countries, these include: the Paris-Nairobi Climate Initiative and the Africa-European Union Energy Partnership; the European Union-Africa Infrastructure Trust Fund; the Climate Investment Funds (including the Clean Technology Fund and the Scaling-Up Renewable Energy Programme in Low Income Countries); the World Bank's Energy Sector Management Assistance Programme; the Climate Institute's Global Sustainable Energy Islands Initiative; the Global Bioenergy Partnership; and the Clean Energy Ministerial "Sustainable Development of Hydropower" initiative. Examples of large-scale renewables projects in developing countries can be found in Brazil, Ethiopia, Kenya, Morocco and South Africa, to name a few.

E. Industrial and agricultural processes

Context

45. The action area "industrial and agricultural processes" addresses the energy efficiency and renewables objectives of Sustainable Energy for All, while the access objective is addressed by the agricultural process sub-area, through the integrated production of food and energy in the agrifood chain. According to *World Energy Outlook 2011*, the industry and agriculture sectors represent 20 per cent of today's global primary energy demand, with their combined share projected to grow slightly to 22 per cent by 2030. When the indirect consumption of energy through the use of electricity is included, their share rises to 28 per cent. Both heat and electricity are required in industrial processes. The potential for renewables as feedstock and heat source is large, especially in combination with energy efficiency options. Modern agrifood and agri-industry systems are more than 70 per cent dependent on fossil fuels, and it is estimated that 30 per cent of the food produced globally is wasted, which entails significant embedded energy losses.

46. This action area thus includes opportunities to: improve the efficiency of business operations and product design; reduce energy consumption and wasteful practices along the value chain; capture and recycle waste heat; and use renewable energy sources in industrial and agricultural processes.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
E1. **Adopt targets and trajectories for the energy efficiency of products and services, using a life-cycle perspective**				
E2. **Advocate for strong Government efficiency standards, develop monitoring mechanisms, and educate consumers and business**				
E3. **Share and apply best practices in operations to improve energy productivity and incorporate renewables**				
E4. **Develop and scale up energy management systems and tools for reducing energy use**				
E5. **Capture and redeploy wasted energy and heat, including natural gas that is now burned off through "flaring"**				

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
E6. **Convert to biomass and other renewable sources in industrial processes where possible and sustainable over the longer term, including for cogeneration**			■	
E7. **Provide sustainable energy access to agriculture and small and medium-sized enterprises**			■	
E8. **Address the energy-water nexus through renewables-based desalination and energy-efficient irrigation pumps**			■	
E9. **Improve access to modern energy services through integrated food and energy production**			■	

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

47. Examples of initiatives that could fall into this action area are: the World Bank's Global Gas Flaring Reduction Partnership, a public-private partnership with support from, inter alia, Statoil; an upcoming Multi-Partner Programme on "Energy-Smart Food for People and Climate" led by the Food and Agriculture Organization of the United Nations; a Green Industry Initiative led by the United Nations Industrial Development Organization; the Cement Sustainability Initiative of the World Business Council for Sustainable Development; the Global Superior Energy Performance Partnership of the Clean Energy Ministerial; the Energy Management Action Network for Industrial Efficiency of the International Partnership for Energy Efficiency Cooperation (IPEEC); the "Cogen for Africa" programme implemented by AfDB; the ISO 50001 specification; the Institute of Industrial Productivity's best practice guidelines; and numerous best practice efforts within individual industries (e.g., those compiled under the Global Compact).

F. Transportation

Context

48. The action area "transportation" supports the efficiency and renewables objectives of Sustainable Energy for All. Transportation accounts for more than 27 per cent of final energy consumption worldwide (approximately 46 million barrels of oil per day). By 2030, global consumption is estimated to increase by 60 per cent to 90 per cent, owing primarily to increasing road freight traffic and passenger vehicles. The average rate of fuel economy improvement in personal vehicles across the countries of the Organization for Economic Cooperation and Development was 2.2 per cent per year from 2005 to 2008, whereas fuel efficiency decreased in developing countries by 0.7 per cent during the same period. Targets for further improvements are, and need to be, substantially higher and impact all

markets. Currently, renewable biofuels account for about 2 per cent of the energy used for transport, and electric vehicles power less than 0.1 per cent of global transport. The *Global Energy Assessment* estimates that 70-80 exajoules per year of efficiency savings are achievable in this sector by 2030. Approximately one third of these gains can come from technological efficiencies (e.g., improvements to engines and vehicle design or the use of electric vehicles). Two thirds of the total opportunity is available through avoided demand (e.g., driving less and traffic management).

49. This action area includes all options that improve efficiency and reduce fuel consumption per distance travelled, shift fuel demand to sustainable biofuels or electric power trains, promote modal shifts to less polluting and more efficient transportation means, and reduce demand for transportation services.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
F1. **Implement or increase fuel standards for internal combustion engine vehicles**	■	□	■	□
F2. **Expand the use of alternative-fuel vehicles (e.g., natural gas vehicles, flex-fuel vehicles, electric power trains)**	■	□	■	■
F3. **Improve and scale up the use of sustainable first- and second-generation biofuels without impinging on food and water security** Primary stakeholders: fuel suppliers and researchers	■	■	■	
F4. **Invest heavily in public transportation infrastructure** to increase its use	■			□
F5. **Educate drivers on fuel-efficient driving ("eco-driving") and encourage on-board use of Eco Mode functions**	■		□	■
F6. **Offer ability to telecommute to employees to reduce driving demand** Primary stakeholders: employers	■	□	■	□
F7. **Plan transit-oriented developments so residents can either walk or easily take public transit** Primary stakeholders: urban planners and real estate developers	■		■	
F8. **Develop and adopt more efficient ship designs with new propulsion and combustion systems or that use renewable fuels** Primary stakeholders: technology providers and shipping companies	□		■	
F9. **Adopt new fuels and fuel-efficient aircraft designs** Primary stakeholders: airlines and aircraft manufacturers	■		■	

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

50. Examples of initiatives that could fall into this action area are: the 50by50 Global Fuel Economy Initiative, with its many stakeholders (the United Nations Environment Programme (UNEP), IEA, the International Transport Forum, the FIA Foundation for

the Automobile and Society, the International Council on Clean Transportation); the Electric Vehicles Initiative of the Clean Energy Ministerial; the Low Carbon Vehicle Partnership of the United Kingdom of Great Britain and Northern Ireland; the International Air Transport Association's fuel conservation and efficiency programmes; and the Global Bioenergy Partnership. Examples of successful vehicle fuel economy standards and/or policies to promote switching to sustainable bioethanol include those of Brazil, States Members of the European Union, Japan, the Republic of Korea, China and the United States of America (California).

G. Buildings and appliances

Context

51. The action area "buildings and appliances" addresses the initiative's objectives of increasing energy efficiency and expanding the share of renewables. The buildings sector is the largest energy consumer of all end-use sectors, accounting for one third of total energy demand. The *Global Energy Assessment* estimates that in industrialized countries with large building stocks, retrofitting the building envelope can decrease current consumption by up to 90 per cent. Appliance efficiency, including lighting, space cooling and heating and refrigeration, presents an attractive set of opportunities, as nearly all solutions to improve energy efficiency reduce net costs in the long run. In total, potential savings are estimated to be 40-50 exajoules per year from this sector.

52. In developing countries, traditional biomass is still one of the most important energy sources for meeting the heating and cooking requirements of buildings, and kerosene is used for lighting. Globally, the breakdown of energy sources currently used in buildings is approximately one third biomass, one third electricity and heat, and one third fossil fuels (gas, oil and coal). Traditional biomass may be phased out with increased urbanization and development, so the opportunity lies in shifting the mix of electricity and heat to more sustainable energy sources. Urbanization will also increase the overall energy consumption of cities, particularly when the energy systems used to serve transportation and building end uses are unplanned, uncoordinated or inefficient. Accordingly, cities provide a number of opportunities for advancing energy efficiency and renewable energy, including municipal water pumping, centralized heating and street lighting.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
G1. **Enact and enforce stricter building codes and higher appliance energy efficiency standards**	■		■	■
G2. **Retrofit municipal and public buildings, street lighting and urban water pumping systems by incorporating efficiency criteria into procurement practices, including energy savings performance contracting**	■	■		
G3. **Address residential retrofit needs by properly valuing energy efficiency and incentivizing investment (such as through utility demand-side management programmes, the use of energy service companies, and performance contracting mechanisms)**	■		■	

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
G4. **Make effective use of rooftops through the extension of rooftop solar in sunny areas and expanded use of "cool roofs" that employ white paint or reflective tile to limit heating**			■	
G5. **Retrofit commercial offices with advanced lighting, electronics and heating/cooling equipment, and obtain certification under green building standards (e.g., LEED)**	□		■	
G6. **Innovate on technology solutions that improve overall efficiency (energy productivity) and reduce/eliminate standby/phantom electricity losses**	■		■	□
G7. **Deploy and use advanced technologies to enable energy-saving behaviour and raise consumer awareness about simple steps to reduce energy demand from everyday products and through energy efficiency labelling schemes**	■	□	□	■
G8. **Encourage the regulatory phasing-out of inefficient appliances, such as incandescent lamps**	■	□		□

Note: Other relevant high-impact opportunities can be found under "enabling action areas" — e.g., national policies, finance, capacity-building and business models.

Legend: ■ Significant impact

□ Some impact

53. Examples of initiatives that could fall into this action area are: the Super-efficient Equipment and Appliance Deployment initiative of the Clean Energy Ministerial and the International Partnership for Energy Efficiency Cooperation; the "en.lighten" initiative of UNEP and the Global Environment Facility; the Efficient Electrical End-use Equipment initiative of IEA; the Building Codes Assistance Project; the Energy Efficiency in Buildings project of the World Business Council for Sustainable Development; the Public Procurement of Energy Efficiency Services initiative of the World Bank and the Energy Sector Management Assistance Programme; various smart/clean/sustainable/green/low-carbon cities initiatives of IRENA, the United Nations Human Settlements Programme, the Economic Commission for Europe, the Department of Economic and Social Affairs, and industry stakeholders; the Global Buildings Performance Network of the ClimateWorks Foundation; the C40 Cities Climate Leadership group; the Municipal Network for Energy Efficiency; and the European Union Energy Performance Buildings Directive 2010.

W. Energy planning and policies

Context

54. The action area "energy planning and policies" supports all three objectives of Sustainable Energy for All. It focuses on creating national energy agendas (or regional/city plans, where appropriate) with supportive policies and regulatory frameworks that are clear, transparent and predictable and that create the right

environment for long-term investments, along with robust, effective institutional frameworks. Opportunities in this action area could include the development of a formal national sustainable energy strategy — ranging from a broad-based energy access strategy to an electricity sector integrated resource plan — aligning standards and targets across levels of Government, developing institutional capacity to implement policy change, or using Government procurement and other mechanisms to incentivize market transformation.

55. Country action is one of the first linchpins for the success of Sustainable Energy for All. A precursor to effective action at the country level is a set of well-thought-out plans and strategies for attracting, supporting and streamlining investment. Each country's plan will be shaped by its own resource endowment, local circumstances and needs (e.g., energy access may be the top priority for some), but all will support increased action and investment to build energy efficiency and renewable energy.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
W1. **Develop a framework for long-term energy planning, including integrated resource planning, incorporating targets and milestones for renewable energy, energy efficiency and energy access, and the dissemination of existing methodologies and best practices in energy planning**	■			
W2. **Improve and disseminate resource assessment methodologies and develop technical assistance capacity to help countries map resource availability, grid expansion plans and the need for decentralized electricity solutions**	■	■		
W3. **Actively support international cooperation among Governments on a bilateral or multilateral basis, including regional cooperation and market integration**	■	■		
W4. **Develop global and regional technology road maps that facilitate international discussion and create specific action points that address opportunities and barriers for renewable energy and energy efficiency applications in end-use sectors**	■	■		
W5. **Create more favourable business environments with appropriately refreshed (or new) policies, regulations and energy plans to incentivize commercial investments and develop markets (e.g., tariff reforms and regulatory frameworks to promote transparency and efficiency)**	■	■		
W6. **Efficiently mesh project preparation, technical assistance for institutional and regulatory development, and debt/equity financing**	■	■	■	
W7. **Expand and harmonize financial de-risking mechanisms and tools, such as loan guarantee mechanisms and partial risk guarantee approaches**			■	

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
W8. **Strengthen coordination among private, international and national stakeholders at the global, regional and national levels**	■	■	□	□
W9. **Rationalize and phase out inefficient fossil-fuel subsidies**	■			

Legend: ■ Significant impact

□ Some impact

56. Existing initiatives that could fall into this action area are: the global renewables resource map, renewable readiness assessments and renewable energy scenarios and strategies of IRENA; the IPEEC Policies for Energy Provider Delivery of Energy Efficiency (PEPDEE) initiative to disseminate best practices in utility-delivered energy efficiency programmes, along with regulatory policies that encourage energy providers to implement energy efficiency; technology road maps developed by IEA; the Global Bioenergy Partnership; the Sustainable Development of Hydropower initiative of the Clean Energy Ministerial; the Energy+ international partnership led by Norway, which aims to address energy access, energy efficiency and renewables; the Economic Community of West African States energy protocol; the "concept city" approach of the Masdar City project in the United Arab Emirates and King Abdullah City for Atomic and Renewable Energy in Saudi Arabia; the Climate Investment Funds under the United Nations Framework Convention on Climate Change, especially the Clean Technology Fund's country-level clean energy investment plans and the Scaling-up Renewable Energy Programme in Low Income Countries; and the Commitments of the Group of Twenty and Asia-Pacific Economic Cooperation to rationalize/phase out inefficient fossil fuel subsidies.

X. Business model and technology innovation

Context

57. The action area "business model and technology innovation" supports all three objectives of Sustainable Energy for All, promoting energy access and renewable energy, by making it attractive for the private sector to pursue decentralized electricity solutions in communities or regions that lack access to the grid, and energy efficiency, by addressing market failures that prevent individuals and small businesses from adopting energy-saving technologies because of their initial capital costs (for example, through business models that allow utilities to cover the up-front costs of more efficient energy products and to recover those costs from users over time). Technology innovation policies are essential to maintaining and accelerating technology development and deployment. Basic and applied research and development, demonstration projects, continuous improvement through learning by experience, and efforts to foster partnerships, share information and support technology and knowledge transfer are needed to accelerate progress.

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
X1. **Support the development of energy efficiency and energy access solutions, and develop delivery and finance value chains** Primary stakeholders: local utilities	■		■	
X2. **Undertake matchmaking between small enterprises and international companies in niche markets through product purchases, training, supply chain development and supplier credit**	■		■	
X3. **Develop innovative payment approaches that overcome consumer resistance to high up-front costs for energy-efficient and renewable energy technologies — i.e., a lease/sale approach for energy products, and/or pay-as-you-go mobile payments and the engagement of local financial institutions in providing end-user finance**			■	■
X4. **Organize community-based ownership of those activities that individuals cannot afford but that help the whole community**				■
X5. **Integrate energy enterprise creation into agriculture and business development activities**	■			
X6. **Provide support for research, development and demonstration activities on the part of academics, research centres, industry, small and medium-sized enterprises and local entrepreneurs**		■		■
X7. **Promote and support widespread use of new inventions and innovations through competitions to incentivize breakthroughs**		■		■
X8. **Launch an energy enterprise portal combining distance learning techniques with local enterprise development expertise to stimulate the preparation of multiple investment-grade energy access business plans**		■		■

Legend: ■ Significant impact

□ Some impact

58. Examples of initiatives that could fall into this action area are: E+Co's approach to supporting energy entrepreneurs and small-scale business start-ups; the Barefoot College's concept of community-based training and deployment of solar systems; CleanStar Mozambique's integrated approach to energy and agribusiness; SELCO Labs' development of energy solutions that respond to niche consumer needs (e.g., silkworm farmers and midwives).

Y. Finance and risk management

Context

59. The action area "finance and risk management" supports all three objectives of Sustainable Energy for All. Reaching those objectives by 2030 will require substantial amounts of capital from the public sector, the private sector and other donors. The *Global Energy Assessment* estimates that annual energy investments

will need to increase by about one third from the current $1.3 trillion to $1.8 trillion. More than 75 per cent of this capital will need to come from the private sector. Global capital markets, national banks and financial institutions and their interactions with countries, donors, businesses and civil society will be increasingly important in this regard. Mechanisms are needed to accelerate investment, both through the more effective leveraging of public funds and through the development of sustainable capital markets.

60. This action area includes approaches and instruments to mobilize the amount of capital required, to direct that capital to the appropriate priority opportunities and, very important, to reduce the risk of private investment in sustainable energy through the targeted use of philanthropic and public capital and the engagement of local financial institutions.

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
Y1. **Use public funds for loan guarantees, risk mitigation and first-loss protection and establish global monoline insurance support to help address political and policy risk for sustainable energy investments**	■	■	□	□
Y2. **Reduce the risk of investment in emerging markets by developing integrated development structures that support local banks and focus on capacity-building and financial support for project developers**	■	■	■	□
Y3. **Develop innovative consumer tools such as on-bill financing and PACE (property-assessed clean energy) bonds**	□	□	■	□
Y4. **Allocate a portion of investment portfolios to sustainable energy goals, e.g., investing in sustainable energy funds** Primary stakeholders: institutional and philanthropic investors		■	□	■
Y5. **Support the creation of "investing groups" and seed capital funds that help increase the pool of "smart" capital available to invest in sustainable energy** Primary stakeholders: investors		□	■	
Y6. **Support large-scale aggregation and securitization models that target energy efficiency**		□	■	
Y7. **Develop a coordination mechanism for sustainable energy finance with the ability to match financing needs arising from national energy plans with existing sources of philanthropic, public and private funds**	□	■	■	
Y8. **Focus support on funds that target specific sectors that may catalyse progress, such as energy efficiency, with specific tools such as carbon finance or mezzanine debt**	□	□	■	
Y9. **Accelerate the development of a climate bond market to help drive liquidity and accelerate the take-up of clean energy investment by institutional investors**	□		■	

Legend: ■ Significant impact

□ Some impact

61. Examples of initiatives that could fall into this action area are: the Climate Bonds Initiative; the Global Energy Transfer Feed-in Tariff (GET FiT) programme; the United Kingdom's Capital Markets Climate Initiative; work being done by a range of national development banks such as KfW Bankengruppe and the Brazilian Development Bank and by global public financial institutions such as IFC, the Overseas Private Investment Corporation, ADB and the World Bank; the UNEP Finance Initiative; the European Investment Bank's Global Energy Efficiency and Renewable Energy Fund; the Sustainable Energy Fund for Africa and the Seed Capital Assistance Facility of AfDB; private companies and investment groups participating in the Climate Technology Initiative Private Financing Advisory Network; the Global Environment Facility; the IFC partial credit guarantee facility; and the Global Climate Change Alliance.

Z. Capacity-building and knowledge-sharing

Context

62. The action area "capacity-building and knowledge-sharing" supports all three objectives of Sustainable Energy for All. It includes a diverse array of programmes: technical assistance to Governments, companies and organizations; efforts to build strong local institutions; the gathering and dissemination of knowledge and best practices, including through South-South knowledge exchanges; general advocacy; and consumer education programmes.

63. As the energy system becomes more complex and interdependent on energy efficiency, newly deployed renewable energy and the judicious use of fossil-fuel resources, innovative approaches, successful business models and best practices must be identified to ensure that progress can be made at the required scale. This information must then be made widely known and available so that other stakeholders can learn from it. In parallel, training and capacity-building must be undertaken with a diverse range of stakeholders in the public and private sectors in both developed and developing countries to ensure that best practices can be adopted efficiently and adapted effectively to local contexts.

High-impact opportunities in this action area	**Governments**	**Donors**	**Businesses**	**Civil society**
Z1. **Bolster country/regional standards for the use of clean energy technologies through industry groups or advocacy aimed at policymakers**	■		■	
Z2. **Expand best practices in the supply chain for businesses that have developed clean energy improvements at the corporate level**			■	
Z3. **Offer transformational courses and degree programmes that link innovation in energy and development** Primary stakeholders: academia and think tanks	■			■
Z4. **Form partnerships that leverage academic research to innovate and help diffuse and scale up proven technology** Primary stakeholders: academia and industry			■	■

High-impact opportunities in this action area	Governments	Donors	Businesses	Civil society
Z5. **Implement technology-specific peer-to-peer learning and mentoring programmes, fostering exchanges of local innovations and market development techniques**	▫		■	■
Z6. **Build "heat maps" of critical areas for attention to address problems of energy access and the deployment of energy efficiency and renewable energy**	■	▫	▫	▫
Z7. **Launch communications strategies highlighting entrepreneurship opportunities, policy support mechanisms, sources for technology and access to finance**	■	■		▫
Z8. **Establish technology development and customization centres to respond to the technology needs of small and medium-sized enterprises and microenterprises with a view to improving efficiencies and increasing the share of renewables**	■	■	▫	▫
Z9. **Develop the next generation of in-country/institutional leaders (e.g., through a dedicated fellowship programme or the National Renewable Energy Laboratory Joint Institute for Strategic Energy Analysis, focused on the training of energy analysts)**	■	■		
Z10. **Support the work of consumer organizations in changing markets for energy-using products through consumer education and innovative financing schemes**	■	■		■
Z11. **Create an easy-to-use set of policy and planning tools that will facilitate the integrated development of energy sources and supply**	■	■		▫

Legend: ■ Significant impact ▫ Some impact

64. Existing initiatives that could fall into this action area are: the Clean Energy Solutions Centre of the Clean Energy Ministerial; the IRENA Renewable Energy Learning Partnership; the IEA/IRENA Global Renewable Energy Policies and Measures Database; the Renewable Energy and Energy Efficiency Partnership; the World Bank Group's energy efficiency community of practice and knowledge portal; SouthSouthNorth; the Low Carbon Energy for Development Network; Climatescope of the Inter-American Development Bank and Bloomberg New Energy Finance; Ernst and Young's renewable energy country attractiveness indices; and the United Nations Foundation's global Energy Access Practitioner Network.

Annex

Members of the Secretary-General's High-level Group on Sustainable Energy for All

Co-Chairs

Kandeh Yumkella	Director-General of the United Nations Industrial Development Organization and Chair of UN-Energy
Charles Holliday	Chair of Bank of America

Principals

Farooq Abdullah	Minister of New and Renewable Energy of India
Suleiman Jasir Al-Herbish	Director-General of the OPEC Fund for International Development
Sultan Ahmed Al Jaber	Chief Executive Officer and Managing Director of Masdar
Adnan Amin	Director General of the International Renewable Energy Agency
Peter Bakker	President of the World Business Council for Sustainable Development
John Browne	Partner and Managing Director of Riverstone Holdings
Chen Yuan	Chair of China Development Bank
Steven Chu	Secretary of Energy of the United States of America
Helen Clark	Administrator of the United Nations Development Programme
Luciano Coutinho	President of Brazilian Development Bank
Brian Dames	Chief Executive Officer of Eskom Holdings
Aliko Dangote	President and Chief Executive Officer of the Dangote Group
Christine Eibs Singer	Co-Founder of E+Co
Ditlev Engel	President and Chief Executive Officer of Vestas Wind Systems
Wolfgang Engshuber	Chair of United Nations Principles for Responsible Investment
Carlos Ghosn	Chair and Chief Executive Officer of the Renault-Nissan Alliance

William D. Green	Chair of Accenture
Timur Ivanov	Director General of the Russian Energy Agency
Georgina Kessel	Director-General of the National Bank of Public Works and Services of Mexico
Michael Liebreich	Chief Executive Officer, Bloomberg New Energy Finance
Edison Lobão	Minister of Mines and Energy of Brazil
Peter Löscher	President and Chief Executive Officer of Siemens
Helge Lund	President and Chief Executive Officer of Statoil
Julia Marton-Lefèvre	Director General of the International Union for Conservation of Nature
Ibrahim Mayaki	Chief Executive Officer of the New Partnership for Africa's Development Planning and Coordinating Agency
Mark Moody-Stuart	Chair of the Foundation for the Global Compact
José da Costa Carvalho Neto	Chief Executive Officer of Eletrobras
Andris Piebalgs	European Commissioner for Development
James E. Rogers	Chair, President and Chief Executive Officer of Duke Energy
Sanjit "Bunker" Roy	Founder and Director of the Barefoot College
Shi Zhengrong	Chief Executive Officer of Suntech Power Holdings
Andrew Steer	Special Envoy for Climate Change of the World Bank Group
Achim Steiner	Executive Director of the United Nations Environment Programme
Timothy E. Wirth	President of the United Nations Foundation

Technical Group

Albert Binger	Caribbean Community Climate Change Centre
Faith Birol	International Energy Agency
Abeeku Brew-Hammond	Ghana Energy Commission
Mark Fulton	Deutsche Bank
Vijay Iyer	World Bank
Daniel Kammen	University of California, Berkeley

Susan McDade	United Nations Resident Coordinator for Uruguay
Vijay Modi	Columbia University
Nebojsa Nakicenovic	International Institute for Applied Systems Analysis; Vienna University of Technology
Petter Nore	Norwegian Agency for Development Cooperation
Richard Samans	Global Green Growth Institute
Leena Srivastava	The Energy and Resources Institute